

XE-90

SERVICE MANUAL

*US Model
Canadian Model
AEP Model
E Model*



SPECIFICATIONS

Center frequencies

60 Hz, 125 Hz, 250 Hz,
500 Hz, 1 kHz, 2 kHz,
4 kHz, 8 kHz, 16 kHz

Boost/cut range

± 12 dB

Sub woofer cut-off frequency

80 Hz, 120 Hz (at -3 dB)

Output gain: $-\infty$ to $+8$ dB
or more (cut off slope
 -12 dB/oct)

Frequency response

10 Hz–50 kHz ± 3 dB

Signal-to-noise ratio

More than 95 dB
(A-weighted)

Harmonic distortion (at 1 kHz)

Less than 0.008%

Gain

0 dB

General

Input

Line inputs (phono jacks)
 $\times 1$

Output

Line outputs (phono jacks)
 $\times 3$

Power requirements

12 V DC car battery
(negative ground)

Current drain

300 mA

Mounting dimensions

178 $\times$ 25 $\times$ 135 mm (w/h/d)
(7 $\frac{1}{8}$ $\times$ 1 $\times$ 5 $\frac{3}{8}$ inches)

Weight

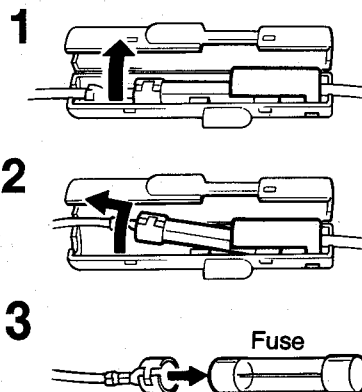
Approx. 650 g (1 lb 7 oz)

Accessories supplied

Mounting hardware (1 set)
Connecting cord (1 set)

FUSE REPLACEMENT

If the fuse blows, check the power connection and replace the fuse. If the fuse blows again after replacement, there may be an internal malfunction. In this case, consult your nearest Sony dealer.



STEREO GRAPHIC EQUALIZER
SONY®

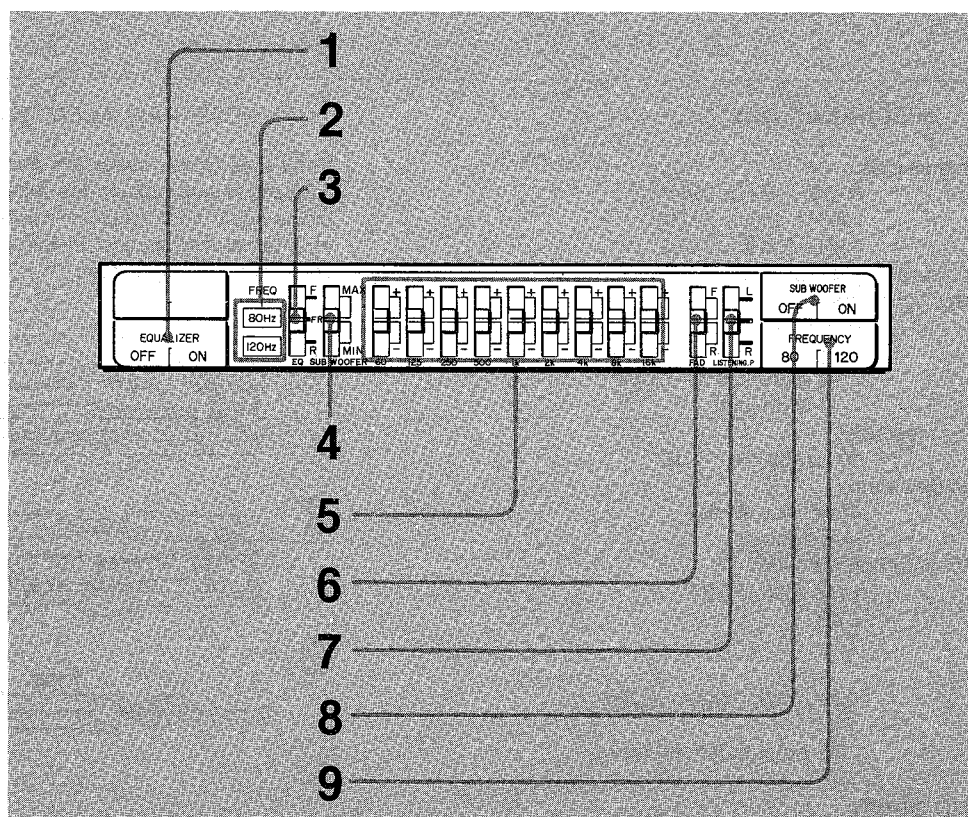


TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
	Specifications	1
SECTION 1. GENERAL		2
SECTION 2. DIAGRAMS		6
2-1. PRINTED WIRING BOARDS		7
2-2. SCHEMATIC DIAGRAM		9
SECTION 3. EXPLODED VIEW		12
SECTION 4. ELECTRICAL PARTS LIST		13

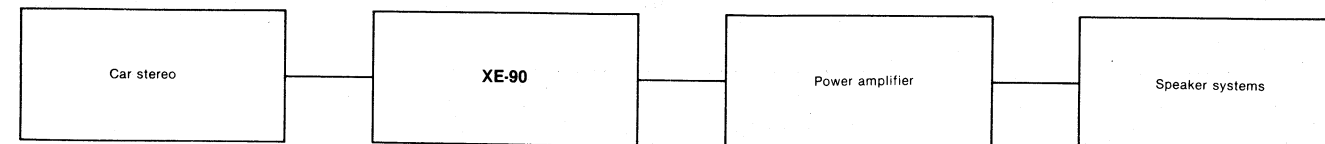
SECTION 1
GENERAL

PARTS IDENTIFICATION



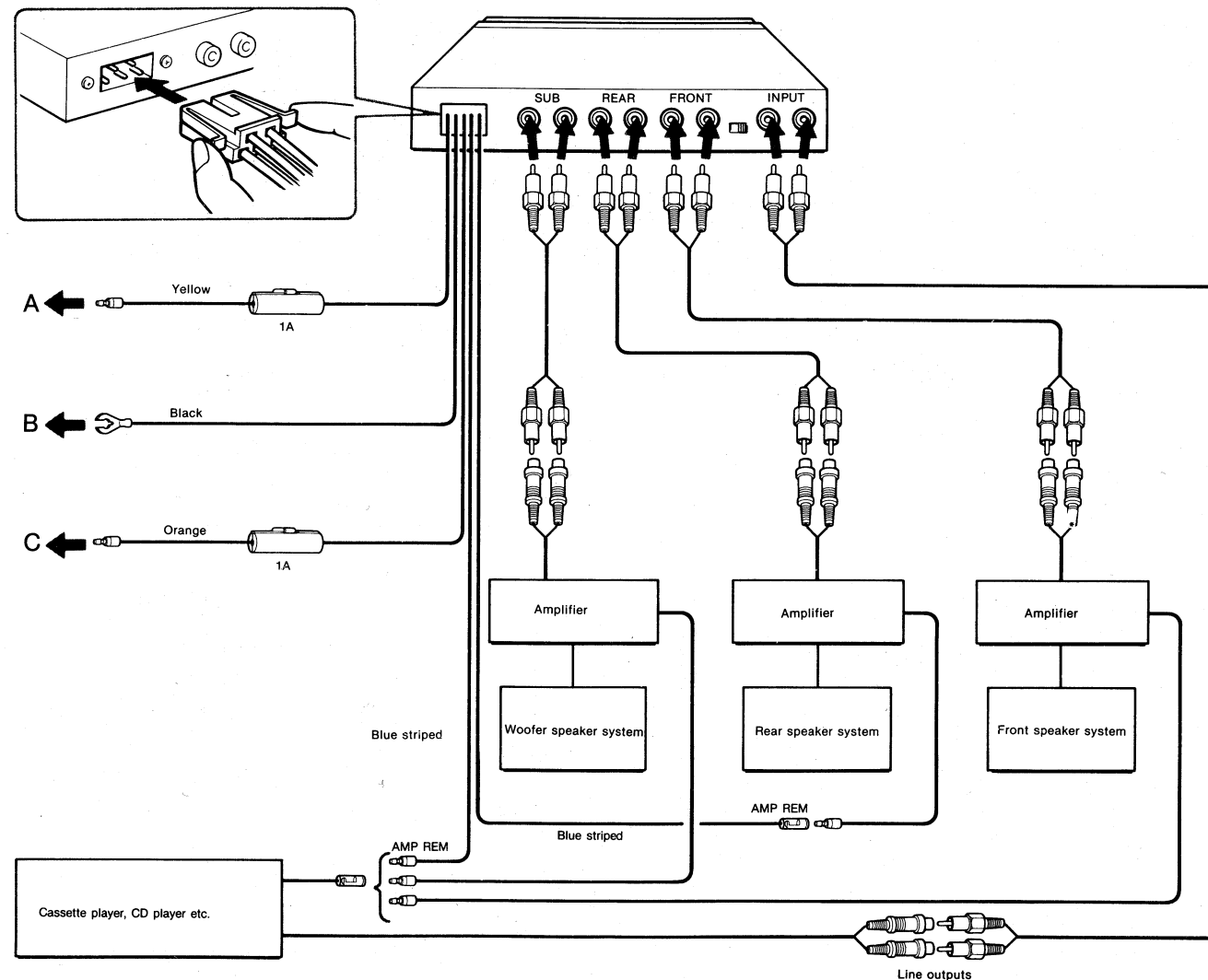
- 1 EQUALIZER switch
- 2 FREQ (sub woofer cut-off frequency) indicators
- 3 EQ (equalizer) selector for speaker system and indicator
- 4 SUB WOOFER level control and indicator
- 5 Equalizer controls and indicators
- 6 FAD (fader) control and indicator
- 7 LISTENING P. (position) selector and indicator
- 8 SUB WOOFER switch
- 9 FREQUENCY (sub woofer cut-off frequency) selector

Diagram of Example



Connection Diagram

Connection leads
 Yellow: power input lead
 Orange (orange, white striped): lighting lead
 Blue (blue, white striped): amplifier remote control lead
 Black: ground wire



A : to the +12 V power terminal which is energized at all times
 B : to metal point of a car
 C : to the small lamp terminal which is energized by the small lamp switch

Caution

- This unit is designed for negative ground 12 V DC operation only.
- Before making connections, disconnect the ground terminal of the car battery to avoid short circuits.
- Connect the yellow power input lead only after all other leads are connected. And be sure to connect it to the positive 12 V power terminal.
- Run all ground wires to a common ground point.
- Notes for the CD player only: Be sure to press the reset button after connection is completed.

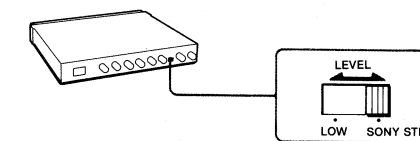
Note on amplifier and program source connection

The red jacks of the XE-90 are for right-channel connection and the white jacks for the left-channel.

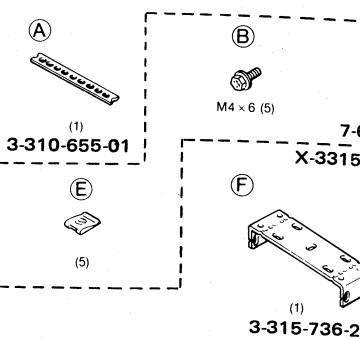
AMP REM (amplifier remote control) lead (remote out; blue/white striped)
 Only one amplifier can be controlled through this jack.
 Avoid multiple connections to the XE-90 REM OUT jack.

When the sound level seems high

When using source equipment of manufacturers other than Sony, adjust the output level of this equalizer by setting the LEVEL switch to LOW. Be sure to set it to SONY STD when using Sony source equipment.

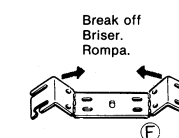


Mounting Hardware

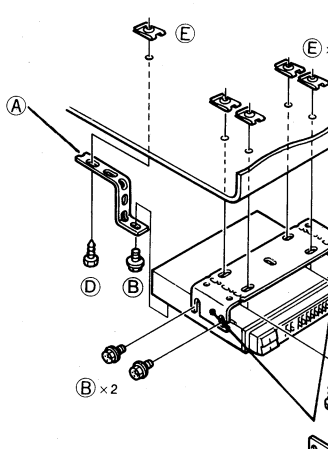


Mounting Example

Example 1



Example 2



Use the supplied mounting hardware.

- 1 Mark the locations of the holes on the bottom of the dashboard using the part (F) as a template.
- 2 Drill 3 mm (1/8 in.) bolt holes.
- 3 Secure the pieces of part (F) which are broken off to the bottom of the dashboard*.

- 4 Secure the unit to part (F).

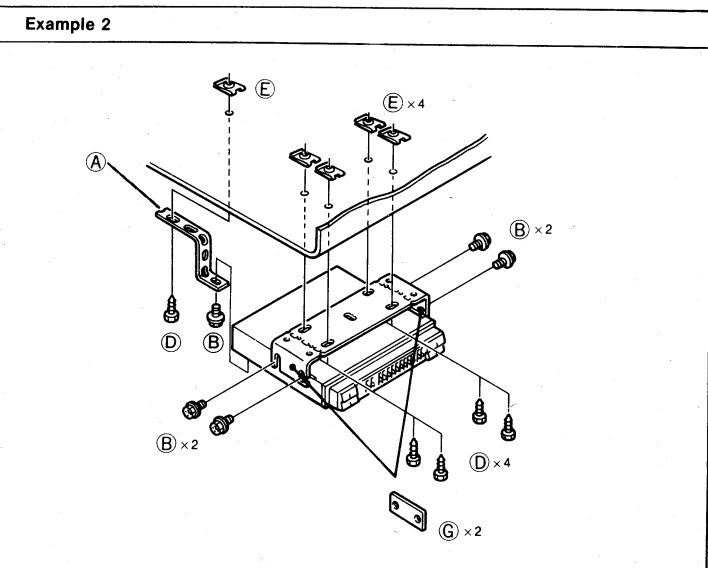
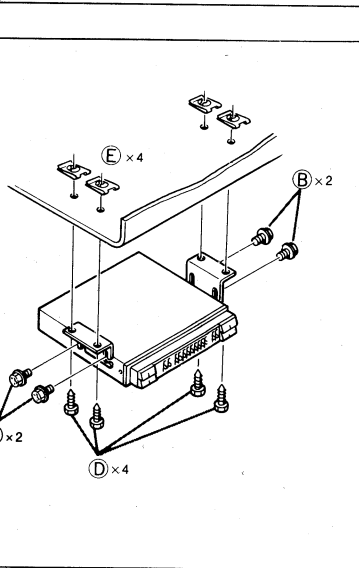
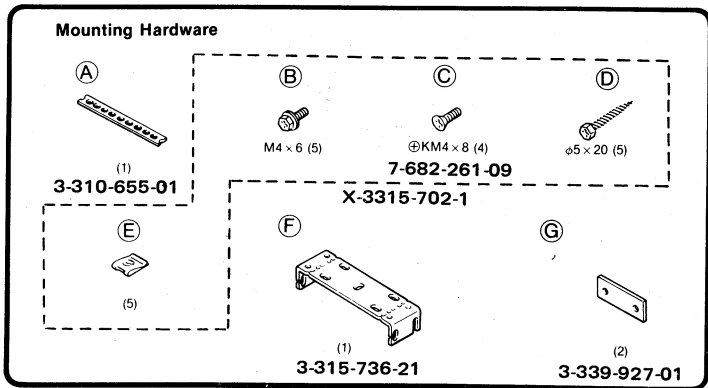
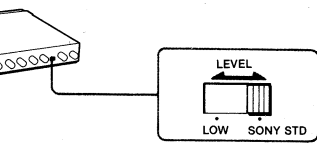
* If the dashboard or the firewall is thin or made of plastic or a similar material, secure the unit with tapping screws and tinnerman clips (C). If it is made of metal plate, the tinnerman clips are not necessary.

and 12 V DC operation only.
ect the ground terminal of the car battery to
only after all other leads are connected. And be
power terminal.
ound point.
to press the reset button after connection is

connection
channel connection and the white jacks for

and (remote out; blue/white striped)
rough this jack.
D REM OUT jack.

nd level seems high
nufacturers other than Sony, adjust the
ng the LEVEL switch to LOW.
using Sony source equipment.



4 Secure the unit to part (F).

* If the dashboard or the firewall is thin or made of plastic or a similar material, secure the unit with tapping screws and tinnerman clips (E). If it is made of metal plate, the tinnerman clips are not necessary.

Adjusting the equalizer controls

1 Operate the car stereo.

2 Press **EQUALIZER ON**.
The indicators on the equalizer controls light.

3 Select the speaker systems from which the sound is to be equalized.

	EQ selector position
To equalize only the sound from front speakers	F (front)
To equalize only the sound from rear speakers	R (rear)
To equalize the sound from both front and rear speakers	FR (front and rear)

If your system is 2-speaker system, set EQ to FR.

4 Adjust the equalizer controls.
The sound will be compensated as adjusted.

To restore to the original sound characteristic
Press **EQUALIZER OFF**.
You can compare the equalized sound with the original one momentarily.

Notice

The EQ selector must be set to exactly at one of the three positions upper (F), center (FR), lower (R); otherwise equalizing effect cannot be obtained.

If no sound comes from the speakers of a 2-speaker system
Move the FAD (fader) control to the center (FR) position.

Adjusting the volume balance

Adjusting the balance between the front and rear speakers

	FAD control setting
To adjust to the same level	Center
To reduce the volume of the rear speakers	Move toward F.
To reduce the volume of the front speakers	Move toward R.

If your system is 2-speaker system, set FAD to the center position.

Shifting the stereo image according to the listener's position

	LISTENING P. control setting
To shift the stereo image to the center	Center
To shift the stereo image to the left	L
To shift the stereo image to the right	R

How to adjust the equalizer controls

First set all controls at their center position, and then slide the control of the frequency band to be equalized gradually upwards or downwards until you perceive an apparent improvement.

Frequency	Effect
60 Hz	Boosts or cuts heavy bass.
125 Hz	Boosts or cuts normal bass in a piece of music.
250 Hz	Governs the low-middle range and greatly influences the overall characteristics of the sound.
500 Hz	Provides warmth for the human voice and instrumental music.
1 kHz	Provides more presence for vocals.
2 kHz	Obtains a brighter brass sound or reduces stridency.
4 kHz	Adjusts the brightness of sound.
8 kHz	Provides a smoother sound for violin and other music.
16 kHz	Affects the general atmosphere.

Boosting the bass sound

Bass sound can be boosted by cutting off the frequencies higher than 80 Hz or 120 Hz from the speakers connected to the SUB WOOFER outputs.

1 Press **SUB WOOFER ON** switch.
The indicator on the SUB WOOFER control and one of the FREQ indicators light.

2 Select the frequency to be boosted, 80 or 120 Hz.

	Frequency
To reinforce the heavy bass sound	80 Hz
To reinforce the normal bass sound	120 Hz

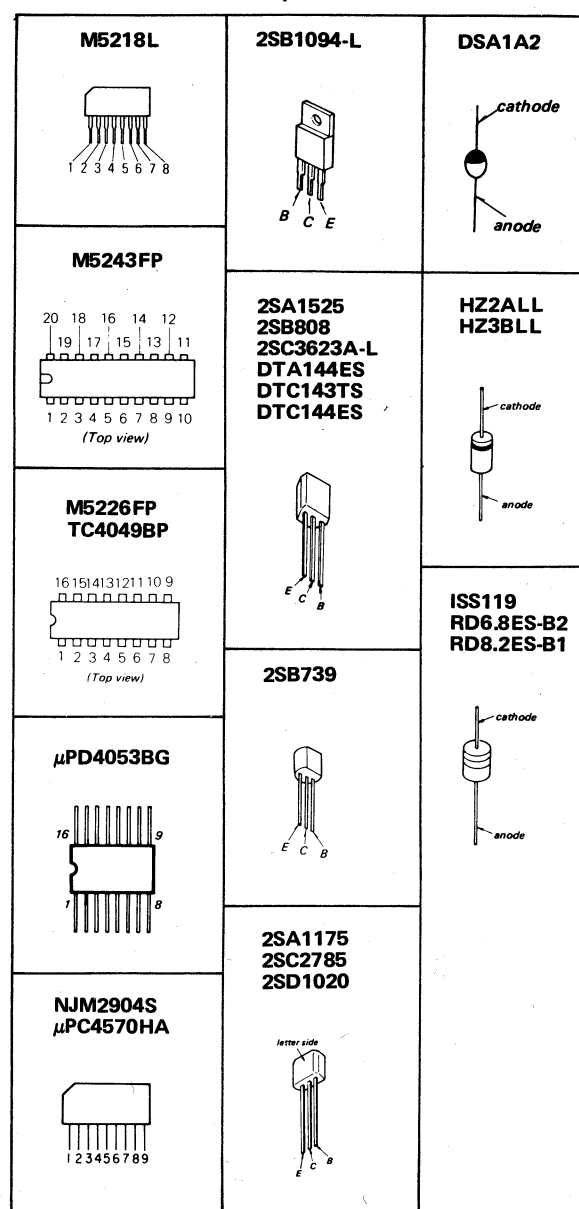
The selected frequency indicator lights.

3 Adjust the sub woofer sound level.

To restore to the original sound level
Press **SUB WOOFER OFF**.

SECTION 2 DIAGRAMS

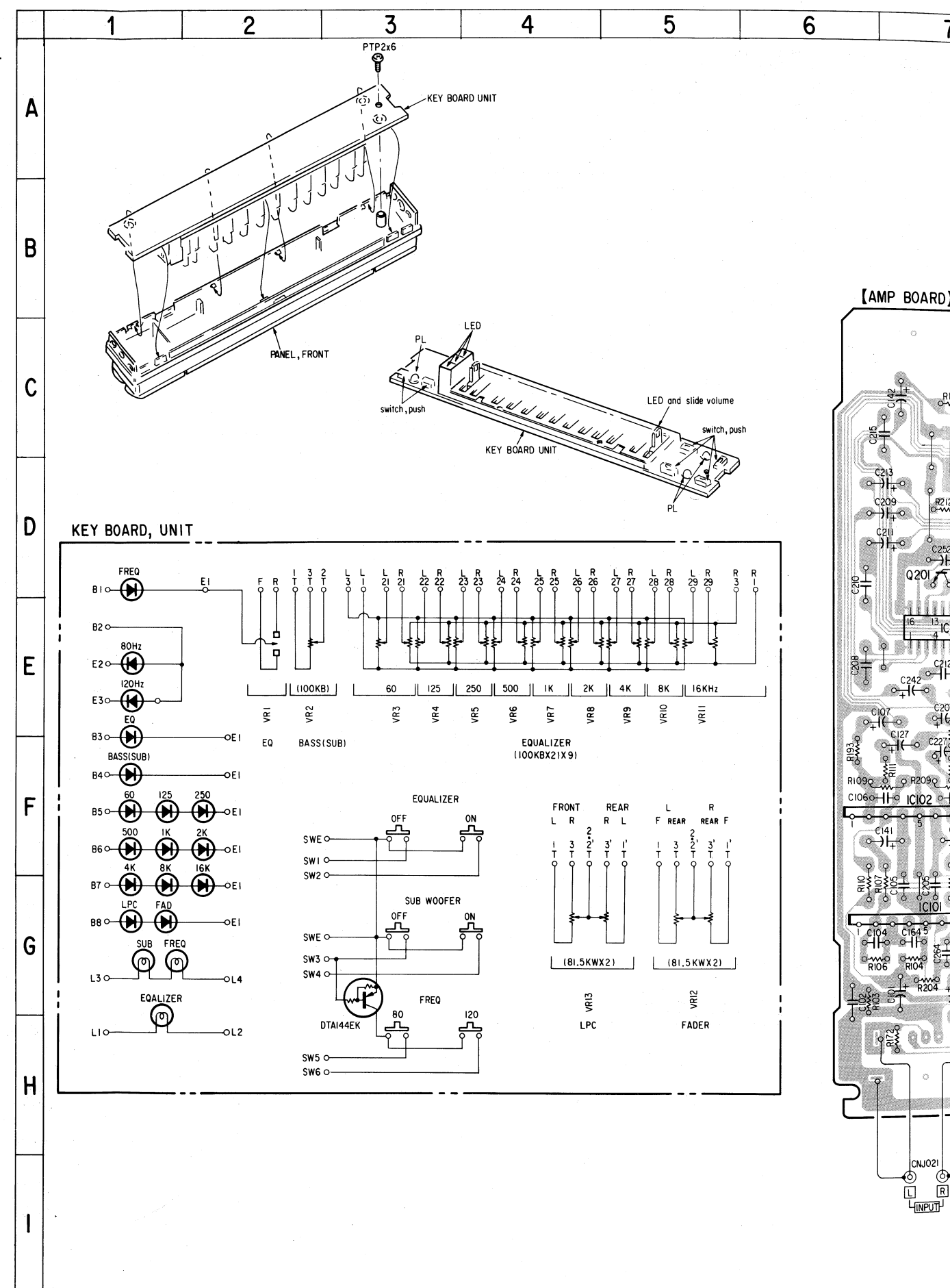
Semiconductors Lead Layout



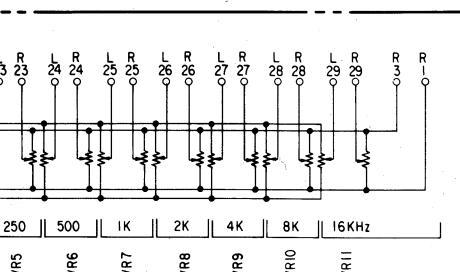
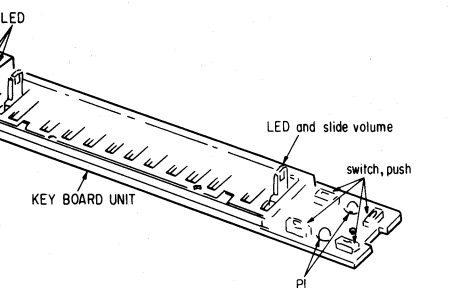
- ○ — : parts extracted from the component side.
- ● — : parts extracted from the conductor side.
- ■ ■ : Pattern on the side which is seen.

SEMICONDUCTOR LOCATION

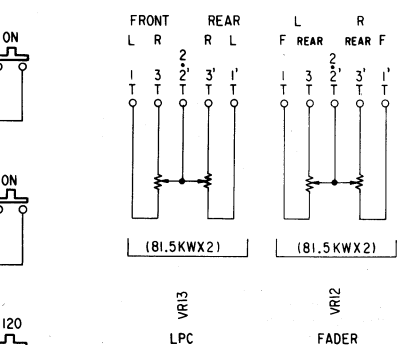
Ref.No.	Location	Ref.No.	Location
IC101	G-7	D401	D-12
IC102	F-7	D402	D-12
IC103	E-8	D403	D-10
IC104	E-7	D404	D-10
IC105	C-7	D405	D-10
IC106	F-8	D406	E-11
IC107	F-9	D407	D-11
IC108	D-9	D408	D-11
IC110	F-12	D409	D-11
IC111	G-8	D410	E-10
IC112	G-9	D412	G-12
IC113	G-10	D451	C-13
IC104	D-11	D452	C-13
IC901	C-13	D453	D-13
		D455	G-12
Q101	D-9	D456	G-12
Q102	G-9	D457	E-13
Q103	G-8	D459	G-12
Q104	G-11	D462	D-13
Q105	G-11	D901	E-11
Q201	D-7	D902	E-11
Q202	F-9	D903	D-14
Q203	H-9	D904	D-14
Q204	F-10	D905	D-12
Q205	H-11	D906	D-14
Q301	F-10	D907	G-14
Q302	H-12	D908	F-14
Q401	C-12		
Q402	E-12		
Q403	E-12	L901	E-14
		L902	G-13
Q404	D-12		
Q405	E-12		
Q406	C-13		
Q407	C-13		
Q451	C-13		
Q452	C-13		
Q453	D-12		
Q901	C-14		
Q902	C-13		
Q903	D-13		
Q904	D-13		



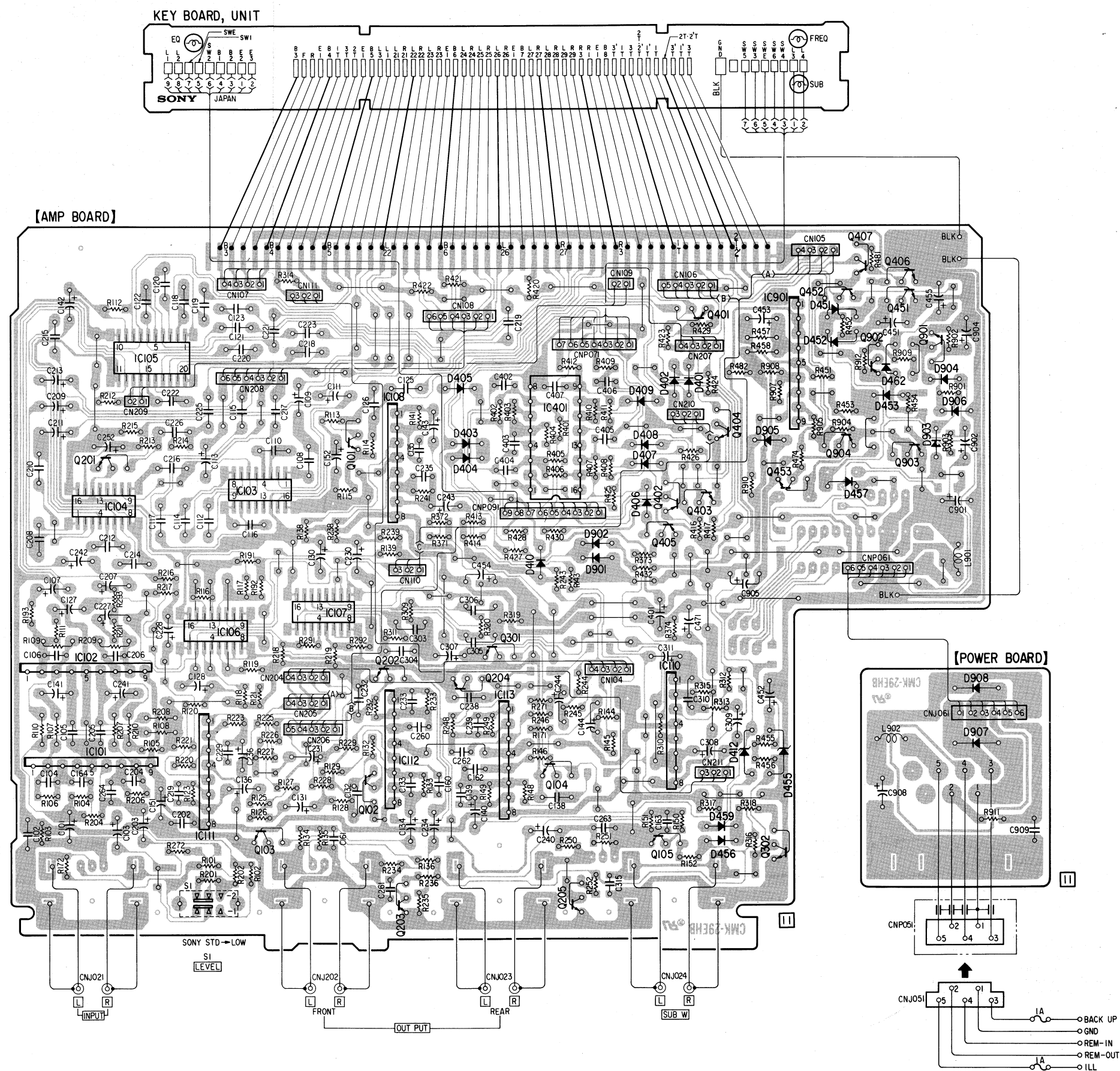
RD UNIT



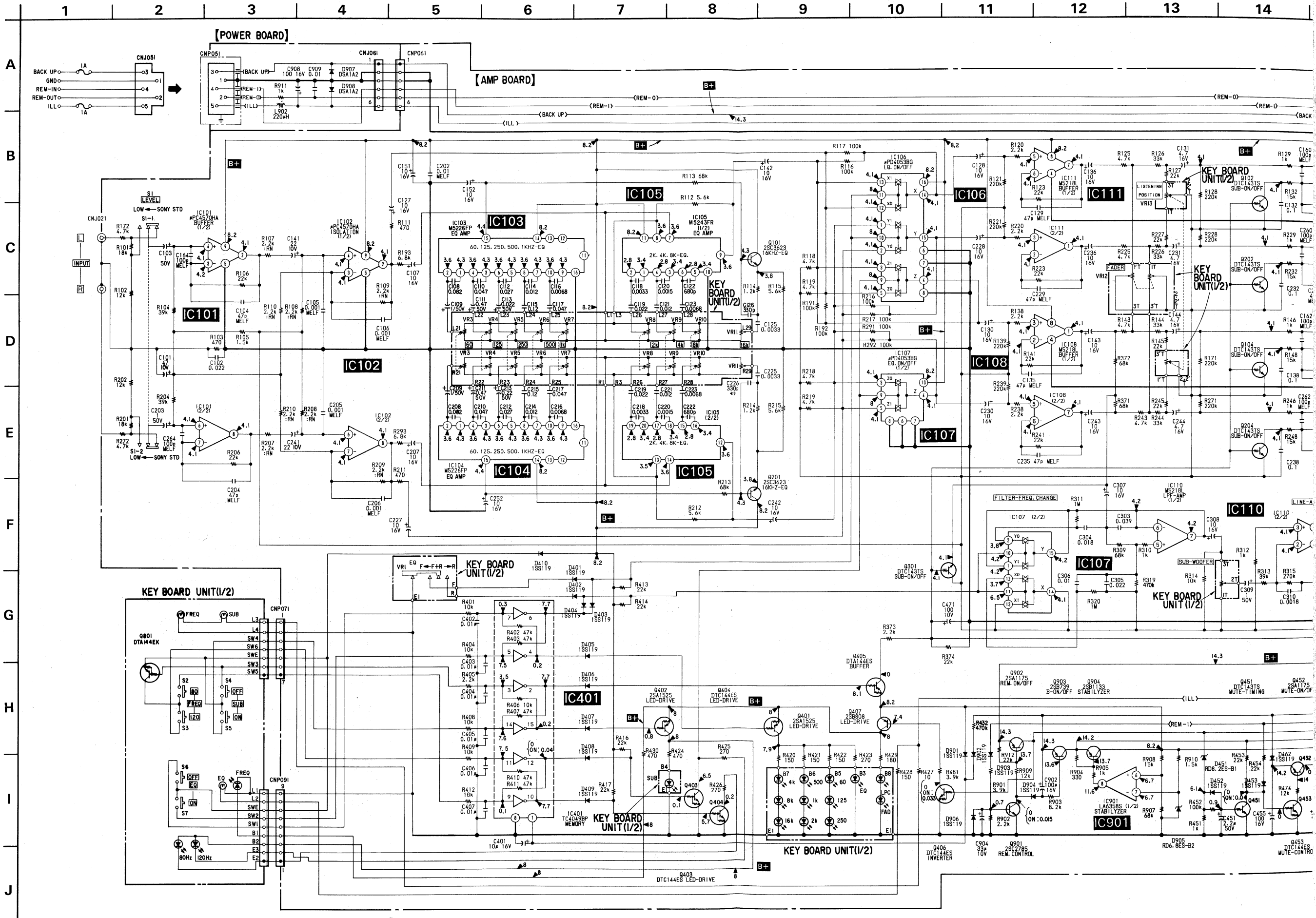
EQUALIZER
(100KBX2)X9)

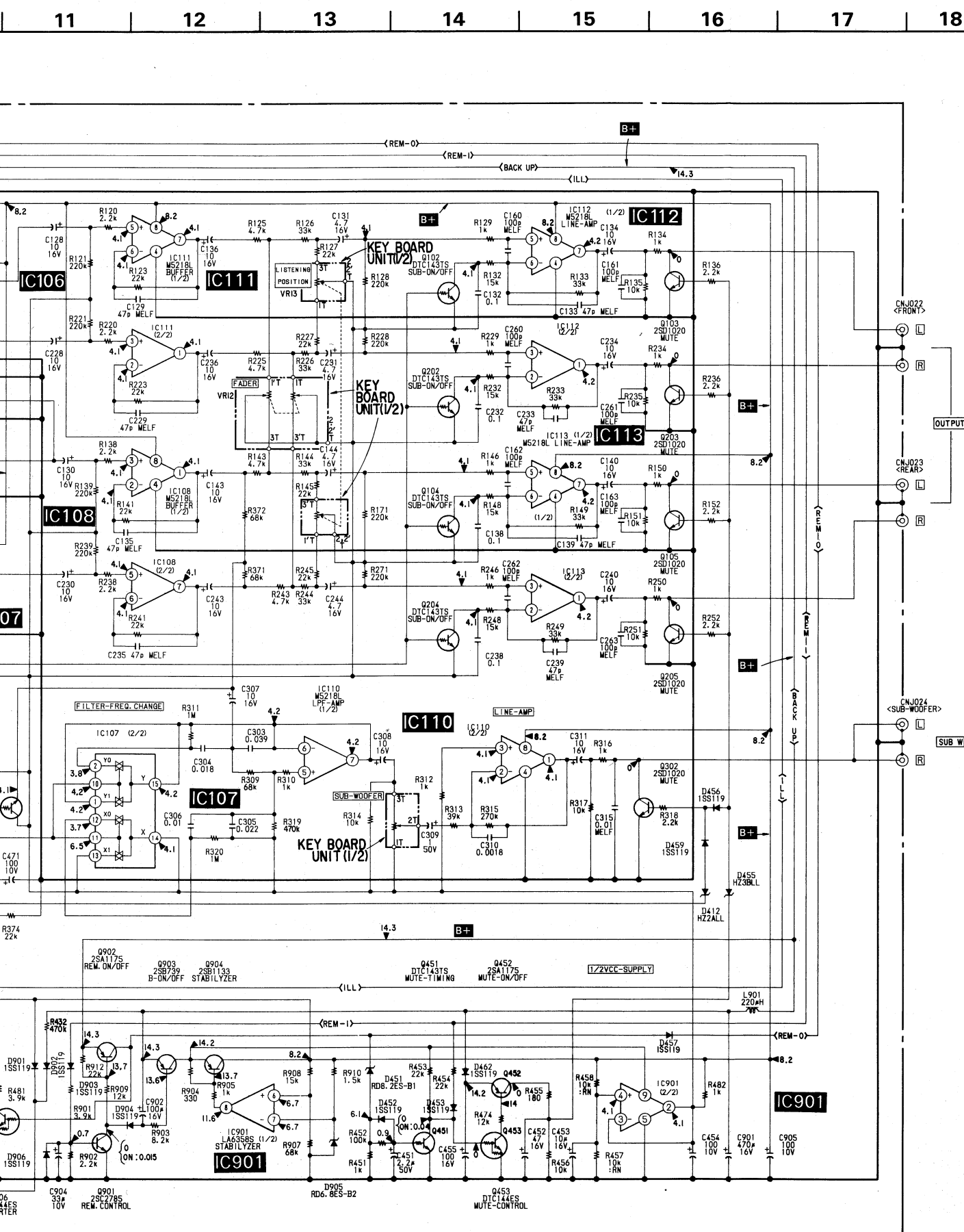


120



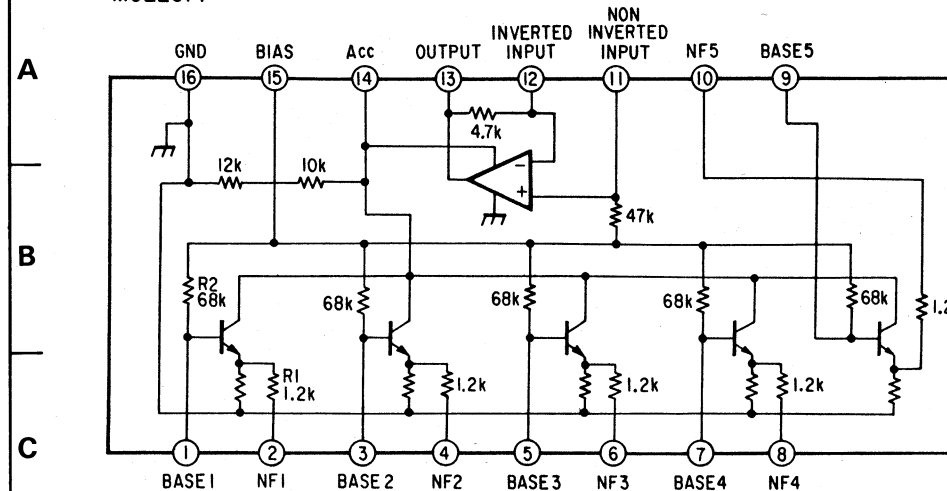
2-2. SCHEMATIC DIAGRAM



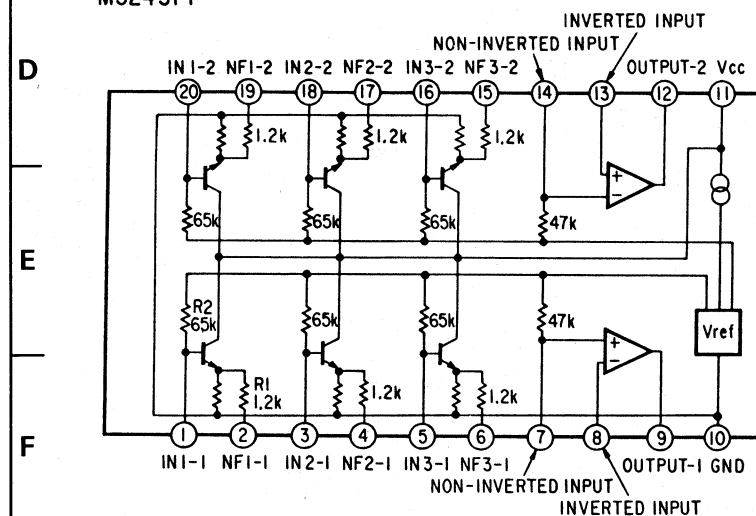


• IC BLOCK DIAGRAMS

M5226FP



M5243FP



Note:

- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.

• Switch

Ref. No.	Switch	Position
S1	LEVEL	SONY STD
S2, 3	FREQ	OFF
S4, 5	SUB	OFF
S6, 7	EQ	OFF

- Voltages are taken with a VOM (50 k Ω /V). Voltage variations may be noted due to normal production tolerances.

SECTION 3 EXPLODED VIEW

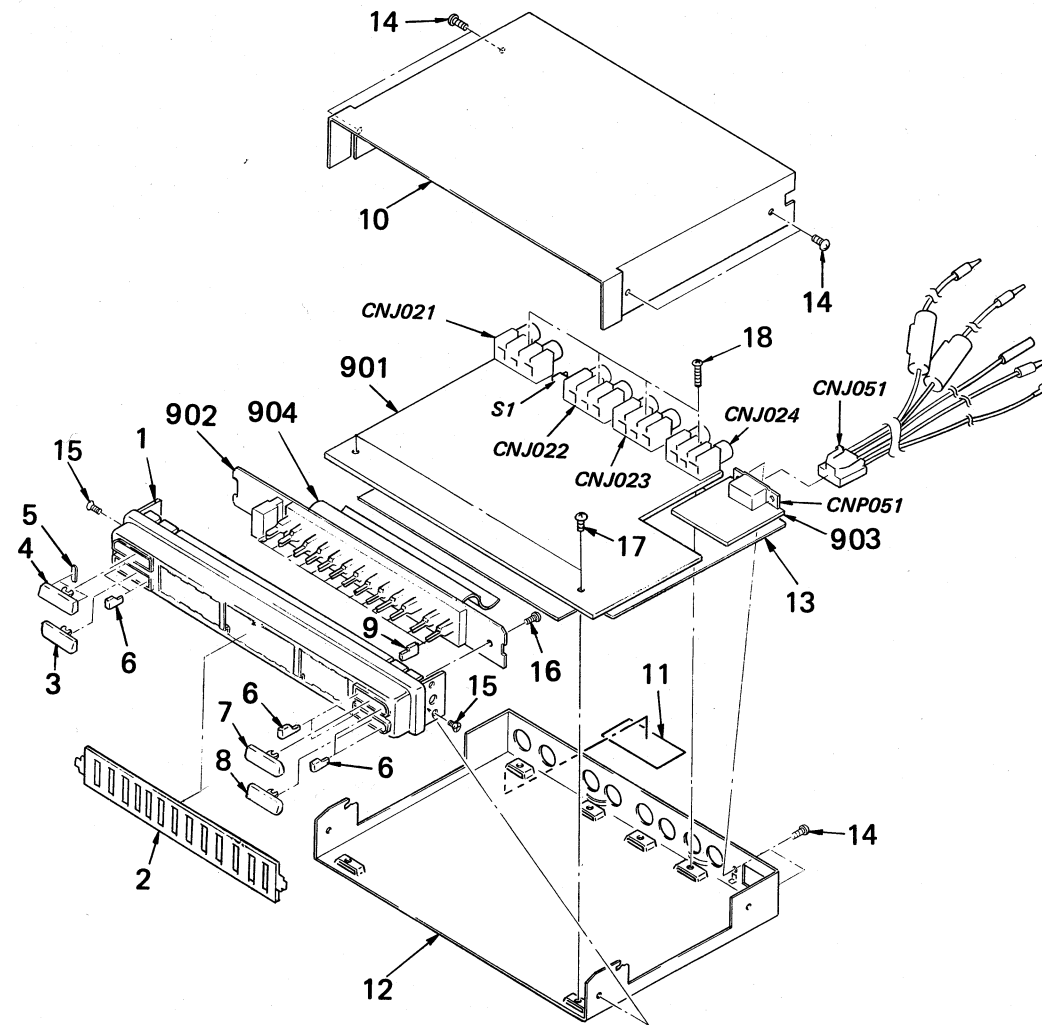
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
Example:
(RED) ... KNOB, BALANCE (WHITE)

↑
Cabinet's Color

↑
Parts' Color



No.	Part No.	Description	Remarks
1	3-346-810-11	PLATE, INDICATION	
2	3-346-814-01	PANEL, FRONT	
3	3-346-813-01	BUTTON (EQ)	
4	3-342-406-01	BUTTON, S	
5	*3-342-430-01	SPACER, RUBBER	
6	3-339-904-01	SLIDER	
7	3-346-812-01	BUTTON (SUB WOOFER)	
8	3-346-809-01	BUTTON (FREQ)	
9	3-346-811-01	KNOB (EQ)	
10	*3-342-450-01	COVER	
11	*3-346-806-01	(US,E).....LABEL, MODEL NUMBER (EXP)	
	3-346-807-01	(Canadian)...LABEL, MODEL NUMBER	
12	*3-342-451-01	CASE (LOWER)	
13	*3-346-815-01	SHEET (B)	
14	7-682-544-09	SCREW +B 3X3	

Remarks	No.	Part No.	Description
	15	7-621-559-20	SCREW +K 2.6X4
	16	7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT
	17	7-621-775-10	SCREW +B 2.6X4
	18	7-621-255-75	SCREW +P 2X12
	901	*A-3279-743-A	MOUNTED PCB, AMPLIFIER
	902	1-464-966-11	KEY BOARD, UNIT
	903	*1-626-509-11	PC BOARD, POWER
	904	1-626-846-11	PC BOARD, INTERFACE FLEXIBLE
	CNJ021	1-565-412-11	JACK, PIN 2P (INPUT)
	CNJ022	1-565-412-11	JACK, PIN 2P (OUTPUT)
	CNJ023	1-565-412-11	JACK, PIN 2P (OUTPUT)
	CNJ024	1-565-412-11	JACK, PIN 2P (SUB W)
	CNJ051	1-559-898-11	CORD (WITH CONNECTOR)
	CNP051	1-566-624-21	CONNECTOR 5P
	S1	1-570-875-11	SWITCH, SLIDE (LEVEL)

SECTION 4

ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF: μF , PF: $\mu\mu\text{F}$.

RESISTORS

- All resistors are in ohms.
- F: nonflammable

COILS

- MMH: mH, UH: μ H

SEMICONDUCTORS

In each case, $U: \mu$, for example:

UA...: $\mu A...$, UPA...: $\mu PA...$,

Ref.No.	Part No.	Description		
901	*A-3279-743-A	MOUNTED PCB, AMPLIFIER		
902	1-464-966-11	KEY BOARD, UNIT		
903	*1-626-509-11	PC BOARD, POWER		
904	1-626-846-11	PC BOARD, INTERFACE FLEXIBLE		
C101	1-124-236-00	ELECT	47MF	20%
C102	1-130-487-00	FILM	0.022MF	5%
C103	1-124-255-00	ELECT	1MF	20%
C104	1-163-173-00	CERAMIC MELF	47PF	5%
C105	1-163-205-00	CERAMIC MELF	0.001MF	10%
C106	1-163-205-00	CERAMIC MELF	0.001MF	10%
C107	1-124-462-00	ELECT	10MF	20%
C108	1-130-494-11	FILM	0.082MF	5%
C109	1-124-255-00	ELECT	1MF	20%
C110	1-136-161-00	FILM	0.047MF	5%
C111	1-124-465-00	ELECT	0.47MF	20%
C112	1-136-158-00	FILM	0.027MF	5%
C113	1-124-464-11	ELECT	0.22MF	20%
C114	1-130-484-00	FILM	0.012MF	5%
C115	1-130-769-00	FILM	0.12MF	5%
C116	1-130-481-00	FILM	0.0068MF	5%
C117	1-136-161-00	FILM	0.047MF	5%
C118	1-130-477-00	FILM	0.0033MF	5%
C119	1-130-487-00	FILM	0.022MF	5%
C120	1-130-473-00	MYLAR	0.0015MF	5%
C121	1-130-484-00	FILM	0.012MF	5%
C122	1-130-469-00	FILM	680PF	5%
C123	1-130-481-00	FILM	0.0068MF	5%
C125	1-130-477-00	FILM	0.0033MF	5%
C126	1-162-288-31	CERAMIC	330PF	10%
C127	1-124-462-00	ELECT	10MF	20%
C128	1-124-462-00	ELECT	10MF	20%
C129	1-163-173-00	CERAMIC MELF	47PF	5%
C130	1-124-462-00	ELECT	10MF	20%
C131	1-124-245-00	ELECT	4.7MF	20%
C132	1-136-165-00	FILM	0.1MF	5%
C133	1-163-173-00	CERAMIC MELF	47PF	5%
C134	1-124-462-00	ELECT	10MF	20%
C135	1-163-173-00	CERAMIC MELF	47PF	5%
C136	1-124-462-00	ELECT	10MF	20%
C138	1-136-165-00	FILM	0.1MF	5%
C139	1-163-173-00	CERAMIC MELF	47PF	5%
C140	1-124-462-00	ELECT	10MF	20%
C141	1-124-234-00	ELECT	22MF	20%
C142	1-124-462-00	ELECT	10MF	20%
C143	1-124-462-00	ELECT	10MF	20%
C144	1-124-245-00	ELECT	4.7MF	20%

Ref.No.	Part No.	Description	
C151	1-124-462-00	ELECT	10MF
C152	1-124-462-00	ELECT	10MF
C160	1-163-181-00	CERAMIC MELF	100PF
C161	1-163-181-00	CERAMIC MELF	100PF
C162	1-163-181-00	CERAMIC MELF	100PF
C163	1-163-181-00	CERAMIC MELF	100PF
C164	1-163-181-00	CERAMIC MELF	100PF
C202	1-163-059-00	CERAMIC MELF	0.01M
C203	1-124-255-00	ELECT	1MF
C204	1-163-173-00	CERAMIC MELF	47PF
C205	1-163-205-00	CERAMIC MELF	0.001
C206	1-163-205-00	CERAMIC MELF	0.001
C207	1-124-462-00	ELECT	10MF
C208	1-130-494-11	FILM	0.082
C209	1-124-255-00	ELECT	1MF
C210	1-136-161-00	FILM	0.047
C211	1-124-465-00	ELECT	0.47M
C212	1-136-158-00	FILM	0.027
C213	1-124-464-11	ELECT	0.22M
C214	1-130-484-00	FILM	0.012
C215	1-130-769-00	FILM	0.12M
C216	1-130-481-00	FILM	0.006
C217	1-136-161-00	FILM	0.047
C218	1-130-477-00	FILM	0.003
C219	1-130-487-00	FILM	0.022
C220	1-130-473-00	MYLAR	0.001
C221	1-130-484-00	FILM	0.012
C222	1-130-469-00	FILM	680PF
C223	1-130-481-00	FILM	0.006
C225	1-130-477-00	FILM	0.003
C226	1-162-288-31	CERAMIC	330PF
C227	1-124-462-00	ELECT	10MF
C228	1-124-462-00	ELECT	10MF
C229	1-163-173-00	CERAMIC MELF	47PF
C230	1-124-462-00	ELECT	10MF
C231	1-124-245-00	ELECT	4.7MF
C232	1-136-165-00	FILM	0.1MF
C233	1-163-173-00	CERAMIC MELF	47PF
C234	1-124-462-00	ELECT	10MF
C235	1-163-173-00	CERAMIC MELF	47PF
C236	1-124-462-00	ELECT	10MF
C238	1-136-165-00	FILM	0.1MF
C239	1-163-173-00	CERAMIC MELF	47PF
C240	1-124-462-00	ELECT	10MF
C241	1-124-234-00	ELECT	22MF

SECTION 4
TRICAL PARTS LIST

CAPACITORS:
MF: μ F, PF: μ F.
RESISTORS
• All resistors are in ohms.
• F: nonflammable
COILS
• MMH: mH, UH: μ H
SEMICONDUCTORS
In each case, U: μ , for example:
UA...: μ A..., UPA...: μ PA...,
UPC...: μ PC, UPD...: μ PD...

BLE

20% 10V
5% 50V
20% 50V

5% 50V
10% 50V
10% 50V

20% 16V
5% 50V
20% 50V

5% 50V
20% 50V
5% 50V

20% 50V
5% 50V
5% 63V

5% 50V
5% 50V
5% 50V

5% 50V
5% 50V
5% 50V

5% 50V
5% 50V
5% 50V

10% 50V
20% 16V
20% 16V

5% 50V
20% 16V
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5% 50V
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5% 50V
20% 16V
5% 50V

5% 50V
20% 16V
20% 10V

20% 16V
20% 16V
20% 16V

Ref.No.	Part No.	Description				
C242	1-124-462-00	ELECT	10MF	20%	16V	
C243	1-124-462-00	ELECT	10MF	20%	16V	
C244	1-124-245-00	ELECT	4.7MF	20%	16V	
C252	1-124-462-00	ELECT	10MF	20%	16V	
C260	1-163-181-00	CERAMIC MELF	100PF	10%	50V	
C261	1-163-181-00	CERAMIC MELF	100PF	10%	50V	
C262	1-163-181-00	CERAMIC MELF	100PF	10%	50V	
C263	1-163-181-00	CERAMIC MELF	100PF	10%	50V	
C264	1-163-181-00	CERAMIC MELF	100PF	10%	50V	
C303	1-136-492-00	FILM	0.039MF	5%	50V	
C304	1-130-486-00	FILM	0.018MF	5%	50V	
C305	1-130-487-00	FILM	0.022MF	5%	50V	
C306	1-130-483-00	FILM	0.01MF	5%	50V	
C307	1-124-462-00	ELECT	10MF	20%	16V	
C308	1-124-462-00	ELECT	10MF	20%	16V	
C309	1-124-255-00	ELECT	1MF	20%	50V	
C310	1-136-374-00	FILM	0.0018MF	5%	50V	
C311	1-124-462-00	ELECT	10MF	20%	16V	
C315	1-163-590-00	CERAMIC MELF	0.01MF	30%	16V	
C401	1-124-462-00	ELECT	10MF	20%	16V	
C402	1-163-590-00	CERAMIC MELF	0.01MF	30%	16V	
C403	1-163-590-00	CERAMIC MELF	0.01MF	30%	16V	
C404	1-163-590-00	CERAMIC MELF	0.01MF	30%	16V	
C405	1-163-590-00	CERAMIC MELF	0.01MF	30%	16V	
C406	1-163-590-00	CERAMIC MELF	0.01MF	30%	16V	
C407	1-163-590-00	CERAMIC MELF	0.01MF	30%	16V	
C451	1-124-257-00	ELECT	2.2MF	20%	50V	
C452	1-124-236-00	ELECT	47MF	20%	16V	
C453	1-124-462-00	ELECT	10MF	20%	16V	
C454	1-124-584-00	ELECT	100MF	20%	10V	
C455	1-126-101-11	ELECT	100MF	20%	16V	
C471	1-124-584-00	ELECT	100MF	20%	10V	
C901	1-126-103-11	ELECT	470MF	20%	16V	
C902	1-126-101-11	ELECT	100MF	20%	16V	
C904	1-124-229-00	ELECT	33MF	20%	10V	
C905	1-124-584-00	ELECT	100MF	20%	10V	
C908	1-126-101-11	ELECT	100MF	20%	16V	
C909	1-163-059-00	CERAMIC MELF	0.01MF	30%	16V	
CNJ021	1-565-412-11	JACK, PIN 2P (INPUT)				
CNJ022	1-565-412-11	JACK, PIN 2P (OUTPUT)				
CNJ023	1-565-412-11	JACK, PIN 2P (OUTPUT)				
CNJ024	1-565-412-11	JACK, PIN 2P (SUB W)				
CNJ051	1-559-898-11	CORD (WITH CONNECTOR)				
CNP001*1	1-566-624-11	CONNECTOR 5P				
CNP031*1	1-506-985-11	PIN, CONNECTOR (PC BOARD) 3P				
CNP032*1	1-506-985-11	PIN, CONNECTOR (PC BOARD) 3P				
CNP051	1-566-624-21	CONNECTOR 5P				
CNP071*1	1-506-989-11	PIN, CONNECTOR (PC BOARD) 7P				
CNP072*1	1-506-989-11	PIN, CONNECTOR (PC BOARD) 7P				
CNP091*1	1-506-991-11	PIN, CONNECTOR (PC BOARD) 9P				
D401	8-719-911-19	DIODE 1SS119				
D402	8-719-911-19	DIODE 1SS119				
D403	8-719-911-19	DIODE 1SS119				
D404	8-719-911-19	DIODE 1SS119				
D405	8-719-911-19	DIODE 1SS119				
D406	8-719-911-19	DIODE 1SS119				
D407	8-719-911-19	DIODE 1SS119				
D408	8-719-911-19	DIODE 1SS119				
D409	8-719-911-19	DIODE 1SS119				

Ref.No.	Part No.	Description			
D410	8-719-911-19	DIODE 1SS119			
D412	8-719-921-11	DIODE HZ2ALL			
D451	8-719-110-06	DIODE RD8.2ES-B1			
D452	8-719-911-19	DIODE 1SS119			
D453	8-719-911-19	DIODE 1SS119			
D455	8-719-942-32	DIODE HZ3BLL			
D456	8-719-911-19	DIODE 1SS119			
D457	8-719-911-19	DIODE 1SS119			
D459	8-719-911-19	DIODE 1SS119			
D462	8-719-911-19	DIODE 1SS119			
D901	8-719-911-19	DIODE 1SS119			
D902	8-719-911-19	DIODE 1SS119			
D903	8-719-911-19	DIODE 1SS119			
D904	8-719-911-19	DIODE 1SS119			
D905	8-719-109-97	DIODE RD6.8ES-B2			
D906	8-719-911-19	DIODE 1SS119			
D907	8-719-928-26	DIODE DSA1A2			
D908	8-719-928-26	DIODE DSA1A2			
IC101	8-759-106-61	IC UPC4570HA			
IC102	8-759-106-61	IC UPC4570HA			
IC103	8-759-630-99	IC M5226FP			
IC104	8-759-630-99	IC M5226FP			
IC105	8-759-630-91	IC M5243FP			
IC106	8-759-103-25	IC UPD4053BG			
IC107	8-759-103-25	IC UPD4053BG			
IC108	8-759-600-02	IC M5218L			
IC110	8-759-600-02	IC M5218L			
IC111	8-759-600-02	IC M5218L			
IC112	8-759-600-02	IC M5218L			
IC113	8-759-600-02	IC M5218L			
IC401	8-759-240-49	IC TC4049BP			
IC901	8-759-701-04	IC NJM2904S			
L901	1-421-976-11	COIL, CHOKE 220UH			
L902	1-421-976-11	COIL, CHOKE 220UH			
Q101	8-729-107-84	TRANSISTOR 2SC3623A-L			
Q102	8-729-900-74	TRANSISTOR DTC143TS			
Q103	8-729-102-03	TRANSISTOR 2SD1020			
Q104	8-729-900-74	TRANSISTOR DTC143TS			
Q105	8-729-102-03	TRANSISTOR 2SD1020			
Q201	8-729-107-84	TRANSISTOR 2SC3623A			
Q202	8-729-900-74	TRANSISTOR DTC143TS			
Q203	8-729-102-03	TRANSISTOR 2SD1020			
Q204	8-729-900-74	TRANSISTOR DTC143TS			
Q205	8-729-102-03	TRANSISTOR 2SD1020			
Q301	8-729-900-74	TRANSISTOR DTC143TS			
Q302	8-729-102-03	TRANSISTOR 2SD1020			
Q401	8-729-820-09	TRANSISTOR 2SA1525			
Q402	8-729-820-09	TRANSISTOR 2SA1525			
Q403	8-729-900-89	TRANSISTOR DTC144ES			
Q404	8-729-900-89	TRANSISTOR DTC144ES			
Q405	8-729-900-65	TRANSISTOR DTA144ES			
Q406	8-729-900-89	TRANSISTOR DTC144ES			
Q407	8-729-800-83	TRANSISTOR 2SB808			
Q451	8-729-900-74	TRANSISTOR DTC143TS			
Q452	8-729-117-54	TRANSISTOR 2SA1175			

Ref.No.	Part No.	Description			
Q453	8-729-900-89	TRANSISTOR DTC144ES			
Q901	8-729-178-54	TRANSISTOR 2SC2785			
Q902	8-729-117-54	TRANSISTOR 2SA1175			
Q903	8-729-373-92	TRANSISTOR 2SB739			
Q904	8-729-111-67	TRANSISTOR 2SB1094-L			
R101	1-249-432-11	CARBON MELF	18K	5%	1/5W
R102	1-249-430-11	CARBON MELF	12K	5%	1/5W
R103	1-249-413-11	CARBON MELF	470	5%	1/5W
R104	1-249-436-11	CARBON MELF	39K	5%	1/5W
R105	1-249-419-11	CARBON MELF	1.5K	5%	1/5W
R106	1-249-433-11	CARBON MELF	22K	5%	1/5W
R107	1-215-429-00	METAL	2.2K	1%	1/6W
R108	1-215-429-00	METAL	2.2K	1%	1/6W
R109	1-215-429-00	METAL	2.2K	1%	1/6W
R110	1-215-429-00	METAL	2.2K	1%	1/6W
R111	1-249-413-11	CARBON MELF	470	5%	1/5W
R112	1-249-426-11	CARBON MELF	5.6K	5%	1/5W
R113	1-249-439-11	CARBON MELF	68K	5%	1/5W
R114	1-249-038-00	CARBON MELF	1.2K	5%	1/5W
R115	1-249-426-11	CARBON MELF	5.6K	5%	1/5W
R116	1-249-441-11	CARBON MELF	100K	5%	1/5W
R117	1-249-441-11	CARBON MELF	100K	5%	1/5W
R118	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R119	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R120	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R121	1-215-477-00	CARBON MELF	220K	5%	1/5W
R123	1-249-433-11	CARBON MELF	22K	5%	1/5W
R125	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R126	1-249-435-11	CARBON MELF	33K	5%	1/5W
R127	1-249-433-11	CARBON MELF	22K	5%	1/5W
R128	1-215-477-00	CARBON MELF	220K	5%	1/5W
R129	1-249-417-11	CARBON MELF	1K	5%	1/5W
R132	1-249-431-11	CARBON MELF	15K	5%	1/5W
R133	1-249-435-11	CARBON MELF	33K	5%	1/5W
R134	1-249-417-11	CARBON MELF	1K	5%	1/5W
R135	1-249-429-11	CARBON MELF	10K	5%	1/5W
R136	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R138	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R139	1-215-477-00	CARBON MELF	220K	5%	1/5W
R141	1-249-433-11	CARBON MELF	22K	5%	1/5W
R143	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R144	1-249-435-11	CARBON MELF	33K	5%	1/5W
R145	1-249-433-11	CARBON MELF	22K	5%	1/5W
R146	1-249-417-11	CARBON MELF	1K	5%	1/5W
R148	1-249-431-11	CARBON MELF	15K	5%	1/5W
R149	1-249-435-11	CARBON MELF	33K	5%	1/5W
R150	1-249-417-11	CARBON MELF	1K	5%	1/5W
R151	1-249-429-11	CARBON MELF	10K	5%	1/5W
R152	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R171	1-215-477-00	CARBON MELF	220K	5%	1/5W
R172	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R191	1-249-441-11	CARBON MELF	100K	5%	1/5W
R192	1-249-441-11	CARBON MELF	100K	5%	1/5W
R193	1-249-427-11	CARBON MELF	6.8K	5%	1/5W
R201	1-249-432-11	CARBON MELF	18K	5%	1/5W
R202	1-249-430-11	CARBON MELF	12K	5%	1/5W

Ref.No.	Part No.	Description			
R204	1-249-436-11	CARBON MELF	39K	5%	1/5W
R206	1-249-433-11	CARBON MELF	22K	5%	1/5W
R207	1-215-429-00	METAL	2.2K	1%	1/6W
R208	1-215-429-00	METAL	2.2K	1%	1/6W
R209	1-215-429-00	METAL	2.2K	1%	1/6W
R210	1-215-429-00	METAL	2.2K	1%	1/6W
R211	1-249-413-11	CARBON MELF	470	5%	1/5W
R212	1-249-426-11	CARBON MELF	5.6K	5%	1/5W
R213	1-249-439-11	CARBON MELF	68K	5%	1/5W
R214	1-249-038-00	CARBON MELF	1.2K	5%	1/5W
R215	1-249-426-11	CARBON MELF	5.6K	5%	1/5W
R216	1-249-441-11	CARBON MELF	100K	5%	1/5W
R217	1-249-441-11	CARBON MELF	100K	5%	1/5W
R218	1-249-436-11	CARBON MELF	39K	5%	1/5W
R219	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R220	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R221	1-215-477-00	CARBON MELF	220K	5%	1/5W
R223	1-249-433-11	CARBON MELF	22K	5%	1/5W
R225	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R226	1-249-435-11	CARBON MELF	33K	5%	1/5W
R227	1-249-433-11	CARBON MELF	22K	5%	1/5W
R228	1-215-477-00	CARBON MELF	220K	5%	1/5W
R229	1-249-417-11	CARBON MELF	1K	5%	1/5W
R232	1-249-431-11	CARBON MELF	15K	5%	1/5W
R233	1-249-435-11	CARBON MELF	33K	5%	1/5W
R234	1-249-417-11	CARBON MELF	1K	5%	1/5W
R235	1-249-429-11	CARBON MELF	10K	5%	1/5W
R236	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R238	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R239	1-215-477-00	CARBON MELF	220K	5%	1/5W
R241	1-249-433-11	CARBON MELF	22K	5%	1/5W
R243	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R244	1-249-435-11	CARBON MELF	33K	5%	1/5W
R245	1-249-433-11	CARBON MELF	22K	5%	1/5W
R246	1-249-417-11	CARBON MELF	1K	5%	1/5W
R248	1-249-431-11	CARBON MELF	15K	5%	1/5W
R249	1-249-435-11	CARBON MELF	33K	5%	1/5W
R250	1-249-417-11	CARBON MELF	1K	5%	1/5W
R251	1-249-429-11	CARBON MELF	10K	5%	1/5W
R252	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R271	1-215-477-00	CARBON MELF	220K	5%	1/5W
R272	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R291	1-249-441-11	CARBON MELF	100K	5%	1/5W
R292	1-249-441-11	CARBON MELF	100K	5%	1/5W
R293	1-249-427-11	CARBON MELF	6.8K	5%	1/5W
R309	1-249-439-11	CARBON MELF	68K	5%	1/5W
R310	1-249-417-11	CARBON MELF	1K	5%	1/5W
R311	1-215-493-00	CARBON MELF	1M	5%	1/5W
R312	1-249-417-11	CARBON MELF	1K	5%	1/5W
R313	1-249-436-11	CARBON MELF	39K	5%	1/5W
R314	1-249-429-11	CARBON MELF	10K	5%	1/5W
R315	1-215-479-00	CARBON MELF	270K	5%	1/5W
R316	1-249-417-11	CARBON MELF	1K	5%	1/5W
R317	1-249-429-11	CARBON MELF	10K	5%	1/5W
R318	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R319	1-215-485-00	CARBON MELF	470K	5%	1/5W
R320	1-215-493-00	CARBON MELF	1M	5%	1/5W

Ref.No.	Part.No.	Description			
R371	1-249-439-11	CARBON MELF	68K	5%	1/5W
R372	1-249-439-11	CARBON MELF	68K	5%	1/5W
R373	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R374	1-249-433-11	CARBON MELF	22K	5%	1/5W
R401	1-249-429-11	CARBON MELF	10K	5%	1/5W
R402	1-249-437-11	CARBON MELF	47K	5%	1/5W
R403	1-249-437-11	CARBON MELF	47K	5%	1/5W
R404	1-249-429-11	CARBON MELF	10K	5%	1/5W
R405	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R406	1-249-429-11	CARBON MELF	10K	5%	1/5W
R407	1-249-437-11	CARBON MELF	47K	5%	1/5W
R408	1-249-429-11	CARBON MELF	10K	5%	1/5W
R409	1-249-429-11	CARBON MELF	10K	5%	1/5W
R410	1-249-437-11	CARBON MELF	47K	5%	1/5W
R411	1-249-437-11	CARBON MELF	47K	5%	1/5W
R412	1-249-429-11	CARBON MELF	10K	5%	1/5W
R413	1-249-433-11	CARBON MELF	22K	5%	1/5W
R414	1-249-433-11	CARBON MELF	22K	5%	1/5W
R416	1-249-433-11	CARBON MELF	22K	5%	1/5W
R417	1-249-433-11	CARBON MELF	22K	5%	1/5W
R420	1-249-407-11	CARBON MELF	150	5%	1/5W
R421	1-249-407-11	CARBON MELF	150	5%	1/5W
R422	1-249-407-11	CARBON MELF	150	5%	1/5W
R423	1-249-410-11	CARBON MELF	270	5%	1/5W
R424	1-249-413-11	CARBON MELF	470	5%	1/5W
R425	1-249-410-11	CARBON MELF	270	5%	1/5W
R426	1-249-410-11	CARBON MELF	270	5%	1/5W
R427	1-249-393-11	CARBON MELF	10	5%	1/5W
R428	1-249-407-11	CARBON MELF	150	5%	1/5W
R429	1-249-408-11	CARBON MELF	180	5%	1/5W
R430	1-249-413-11	CARBON MELF	470	5%	1/5W
R432	1-215-485-00	CARBON MELF	470K	5%	1/5W
R451	1-249-417-11	CARBON MELF	1K	5%	1/5W
R452	1-249-441-11	CARBON MELF	100K	5%	1/5W
R453	1-249-433-11	CARBON MELF	22K	5%	1/5W
R454	1-249-433-11	CARBON MELF	22K	5%	1/5W
R455	1-249-408-11	CARBON MELF	180	5%	1/5W
R456	1-249-429-11	CARBON MELF	10K	5%	1/5W
R457	1-215-445-00	METAL	10K	1%	1/6W
R458	1-215-445-00	METAL	10K	1%	1/6W
R474	1-249-430-11	CARBON MELF	12K	5%	1/5W
R481	1-249-424-11	CARBON MELF	3.9K	5%	1/5W
R482	1-249-417-11	CARBON MELF	1K	5%	1/5W
R901	1-249-424-11	CARBON MELF	3.9K	5%	1/5W
R902	1-249-421-11	CARBON MELF	2.2K	5%	1/5W

Ref.No.	Part No.	Description			
R903	1-249-428-11	CARBON MELF	8.2K	5%	1/5W
R904	1-249-411-11	CARBON MELF	330	5%	1/5W
R905	1-249-417-11	CARBON MELF	1K	5%	1/5W
R907	1-249-439-11	CARBON MELF	68K	5%	1/5W
R908	1-249-431-11	CARBON MELF	15K	5%	1/5W
R909	1-249-430-11	CARBON MELF	12K	5%	1/5W
R910	1-249-419-11	CARBON MELF	1.5K	5%	1/5W
R911	1-249-417-11	CARBON MELF	1K	5%	1/5W
R912	1-249-433-11	CARBON MELF	22K	5%	1/5W
S1	1-570-875-11	SWITCH, SLIDE (LEVEL)			

ACCESSORY & PACKING MATERIAL

1-556-167-00	CORD, CONNECTION (RC-14)
1-559-898-11	CORD (WITH CONNECTOR)(CNJ051)
3-310-655-01	SUPPORT (ND), FITTING
3-315-736-21	BRACKET, NEW D
3-315-746-01	STOPPER (SMALL)
3-331-323-01	CUSHION (J)
3-336-617-01	BAG, PROTECTION
3-339-927-01	SPACER
*3-346-802-01	INDIVIDUAL CARTON
*3-346-806-01	LABEL, MODEL NUMBER (EXP)
3-701-613-00	BAG, POLYETHYLENE
3-786-040-11	(US,Canadian)...MANUAL, INSTRUCTION
3-786-040-41	(E).....MANUAL, INSTRUCTION
3-786-041-11	MANUAL, INSTRUCTION
3-786-041-41	(E).....MANUAL, INSTRUCTION
7-682-261-09	SCREW *K 4X8
X-3315-702-1	SCREW ASSY (25MM), FITTING